

QUARTERLY PUBLICATION OF THE EUROPEAN ASSOCIATION OF ZOOS AND AQUARIA

ZOOQUARIA

WINTER 2024

ISSUE 124



Small but mighty

New game-changing programmes
for our small mammals



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KEY: a quick guide to frequently used acronyms

CITES: Convention on International Trade in Endangered Species

EEP: EAZA Ex situ Programme

IUCN SSC: International Union for Conservation of Nature Species Survival Commission

LTMP: Long-term Management Plan

RSP: Regional Species Plan

TAG: Taxon Advisory Group

ZIMS: Zoological Information Management System

Zooquaria

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FROM THE DIRECTOR'S CHAIR

In my last 'From the Director's Chair' I shared the struggles that the Executive Office, and indeed many EAZA Members, have been experiencing with staff turnover and recruitment. I am pleased to say that we have turned a corner and are happy to welcome new staff to fill the open places in our team. Many of you will have had the opportunity to meet these new colleagues during the highly successful EAZA Annual Conference. I thank Leipzig Zoo for their strong hosting, and all the delegates who participated. This was the first time our Annual Conference broke the 1,000 delegate mark and there was a definite 'buzz' around the venue and lots of good progress made in the many meetings held during the week. You can find out more about the EAZA Annual Conference in the article on pages 8–9 and watch the plenaries on our EAZA YouTube channel. If going to YouTube is too much for you, never fear, many of the plenary topics are also reflected by articles in this issue of *Zooquaria*. Find out about the ways in which EAZA and our Members are advancing genetic research and policy (page 25), and the milestones and achievements of the European Zoo Nutrition Group (ENG) as they celebrate their 25th anniversary (pages 26–27).

I was fortunate to attend the WAZA Annual Conference in November. As always, this conference brought together zoo and aquarium leaders from across the world to discuss current trends and share best practice. The antipodean location brought an insightful range of presentations on appropriate involvement and representation of First Peoples. It was emphasised that this should be considered across all regions of the world and not only those where First Peoples are predominant.

Understanding and responding to varied cultures was a theme throughout the conference programme. This ranged from developing a supportive staff culture to the potential paradigm shift in the purposes of zoos and aquariums and how advanced technology is already changing cultures. In addition, I was invited to be part of a panel reflecting on the combined progress, as well as challenges, brought about by the WAZA Animal Welfare Goal (which EAZA achieved in 2023). Our Deputy Executive Director, Danny de Man, was part of a session on synthetic biology. He was able to share, hot off the press, the EAZA Position Statement on the Use of Cryopreserved Materials and Biotechnology, which will be detailed in the next issue of *Zooquaria*. You can find out more about the WAZA conference on page 14.

To come full circle back to Europe from Australia, I would like to finish by highlighting the article on page 10 about

EAZA's Manifesto. This valuable document highlights to policymakers across the EU the vital role that nature plays in supporting thriving societies. EAZA Members are encouraged to share the Manifesto with their policymakers and discuss how their zoo or aquarium contributes to helping evidence local priorities and activities alongside global goals such as the Kunming-Montreal Global Biodiversity Framework.

I wish everyone very happy reading as we reach the end of 2024 and look forward to all that is to come in 2025.

Myfanwy Griffith
Executive Director, EAZA

NOTICEBOARD

COUNCIL DECISIONS

The EAZA Annual Conference was superbly hosted by Leipzig Zoo (Germany) at the beginning of October (see page 8). The conference included a meeting of EAZA Council who approved the following membership decisions:

NEW MEMBER DECISIONS

Full Membership

Myskoxcentrum, Sweden
Terrariet Reptile Zoo, Denmark
Tropikariet i Helsingborg, Sweden
Bioparc Acuário de Gijón, Spain
Tropicarium Kolmården, Sweden

Temporary Membership

Lakeland Wildlife Oasis, UK
Ystad Djurpark, Sweden
Oasis Wildlife Fuerteventura, Spain

Temporary Membership to Full Membership

Sendaviva, Spain

Full Associate Membership – Non-public

Arabian Leopard Conservation Breeding Centre, Saudi Arabia

Temporary Associate Membership – Zoo/Aquarium

São Paulo Zoo, Brazil

Candidate for membership

Miskolc Zoo, Hungary

Deny Membership

Badoca Safari Park, Portugal (Full Member applicant)
Son Comte, Spain (Associate Member Non-Public)

EXISTING MEMBER DECISIONS

Temporary Membership

Parc Zoologique de Jurques, France
Touroparc, France

Tierpark Neumünster, Germany

Maintain Full Membership

Parc Animalier et Botanique de Branféré, France
Parc Zoologique de Champrépus, France
Parc Zoologique de La Barben, France
Aachener Tierpark, Germany
Zoologischer Garten Rostock, Germany
Tiergarten Straubing, Germany
Tierpark Bochum, Germany
Zoo Neuwied, Germany
Neunkircher Zoologischer Garten, Germany
Faruk Yalçın Zoo, Turkey
Longleat Safari Park, UK

Drusillas Park, UK
Paradise Park, UK
Port Lympne Wild Animal Park, UK

Temporary Membership to Full Membership

Jihlava Zoo, Czechia

Reinstated to Full Status (From Restricted by the Executive Committee)

Hai Park, Israel (effective from 30 September 2024)

Termination

Marineland Mallorca, Spain
BARK Biopark Barquinha, Portugal (TMUC)
Eram Zoo, Iran (Candidate for Membership)

CORPORATE MEMBERS

New Corporate Members

Evasion Jeux, France
Komodo Zoo Services, Spain
Ungestalt, Germany

Withdrawing Corporate Members

Pangea Rocks, Denmark

EAZA COUNCIL ELECTIONS

In 2025, it will be time to elect a new EAZA Council for 2025–2028. Please find on our website www.eaza.net/ structure some information about the election process and the timeline, as well as details of how EAZA is organised.

EAZA MAKEOVER

We are excited to announce that the new EAZA website and Member Area were launched successfully at the beginning of September! Please explore the new www.eaza.net and use the sections:

- *'What is EAZA?'* and *'How we make a difference'* to showcase to your stakeholders the work you undertake as part of the wider EAZA network
- *'Get involved'* to discover the various ways in which you can get involved in EAZA's activities, the current vacancies in the zoo and aquarium community or how to contact the EAZA Executive Office
- *'Resources'* to find all the publicly available documents, from our core governing documents and EAZA Standards to guidelines, tutorials related to animal care, scientific literature and more

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• *'News'* to stay up to date with our latest information. Why not set up this page as your browser's landing page?

Once you have requested your access to the EAZA Member Area and have received the invitation email, you will be able to enter your brand new space, which is easier to navigate and tailored to your activities within the community (i.e. you will see only the folders of the TAGs, Committees or Working Groups of which you are a member). We wish you a happy discovery and hope you enjoy these new tools!

NEW ARRIVALS

ENDANGERED DEER CALF BORN AT WILHELMA ZOO



© WILHELMA STUTTGART, BIRGER MEIERJOHANN

ON 21 JUNE 2024, an eight-year-old Mesopotamian fallow deer (*Dama mesopotamica*) named Tanni gave birth to a female calf at Wilhelma Zoo (Germany). After three years without offspring, the team in Stuttgart is delighted to announce this renewed success in breeding one of the world's most endangered deer species. The

EAZA region currently holds only 175 individuals, so any contribution to this EEP is a big achievement.

Mesopotamian fallow deer first arrived at Wilhelma in 1983 when a couple was transferred from Opel-Zoo (Germany). The first calf was born in 1987, followed by regular breeding successes in the subsequent years.



The current offspring is the first calf of a seven-year old male called Jean-Luc, received from CERZA (France) in 2021. It is also the 96th surviving Mesopotamian fallow deer born at Wilhelma Zoo. These include our current breeding females, Tina and Tanni. Tanni had already given birth in 2020 but her young died at only two days old because she did not produce enough milk at that time. The healthy female calf is therefore a double cause for celebration, and the zoo hopes that more young will follow in the coming years.

SARUS CRANE SUCCESS AT KARLSRUHE ZOO



THIS YEAR'S CHICK HATCHED ON 25 JUNE
© TIMO DEIBLE, KARLSRUHE ZOO

THE INDIAN SARUS CRANE (*Antigone antigone antigone*) is the largest (sub-)species of crane, growing to 1.8m in height. The IUCN Red List classifies the species as Vulnerable with a decreasing population trend. According to ZIMS, there are only 33 animals currently living in European zoos.

The male living at Karlsruhe Zoo was bred at Bird Park Niendorf (both Germany) in 1990 and arrived here in the same year. The female hatched in 2008 and was hand-raised at the former Bird Park Plantaria Kevelaer-Twisteden (Germany). She arrived in Karlsruhe in 2010 showing strong attachment towards the keepers, which is why the male and female were kept apart by a fence for several months. After displaying mutual feeding behaviour and exchanging branches through the fence, they were successfully brought

together in 2011. The female lost her tameness over time, and the first chick hatched in 2013. Since then, the crane couple has reliably raised one chick per year.

Although they always lay two eggs, in most years only one is fertilised. From our experience, when a chick hatches, the parents start caring for it immediately, leaving the other egg unattended, regardless of whether it contains a second chick. To date, on two occasions (in 2018 and 2022), the abandoned egg was fertilised and was taken to hatch in an incubator and then hand-raised. Apart from 2020, when the chick died abruptly overnight at three months old (the post-mortem exam revealed only an unspecific bacterial infection), the 13 other offspring have been successfully raised and transferred to other institutions.

In Karlsruhe, nest-building and egg-laying occur from June to July. With an incubation period of 30–32 days, the chick then hatches in July or August. In the past, we have transferred the young at six months of age at the earliest.

Our general husbandry management of this species is almost completely 'hands-off'. The staff enter the enclosure only on very few occasions, and daily feeding is carried out through the fence. The enclosure is about 1,000 m² in size and accessible to visitors from two connected sides. At the rear of the enclosure, the vegetation is relatively dense, and the animals have open access to water. Although they spend most of the daytime in the open area in front, breeding only occurs in the thicket.



SELECTIVE BREEDING IN HYLOBATIDAE GIBBONS USING CONTRACEPTIVE IMPLANTS

THE SIAMANG IS NATIVE TO Thailand, Malaysia and Indonesia (Sumatra) and is classified as Endangered by the IUCN due to forest destruction, road construction, mining and opportunistic poaching. As there is considerable competition for *ex situ* space with other gibbon species and the long life expectancy, the EEP Coordinator recommends well-coordinated selective breeding of only a few pairs each year. Breeding recommendations have followed the programme's LTMP from 2020.

Parc Animalier de Branféré (France) has housed siamangs (*Symphalangus syndactylus*) since 1974. The first birth occurred in 1982, since when 17 siamangs have been born there, contributing to the EEP. Gibbon population management is challenging, due to the animal's social structure, long life expectancy and available space in human care. EEP Coordinators aim to maintain viable and controlled populations while ensuring the reproductive status and health of potential breeders. Recent experiences with gibbon species from the family *Hylobatidae* suggest that proven breeder females can be under hormonal contraception for a long time (more than 10 years) and fertility can be regained as soon as the

implant is removed. The case that follows confirms the possibility for successful reproduction in a siamang after long-term progestin contraception.

Malacca, a 27-year-old female siamang who is housed at the Parc, reproduced five times between 2005 and 2013. She was under contraceptive implant (½ Nexplanon®, 64mg etonogestrel, MSD, changed every two years) from February 2015 until spring 2023 until a breeding recommendation was received. One month after implant removal, the female went into oestrus and copulations were observed; 222 days after the last observed copulations, on 26 November 2023, a healthy female

was born. Malacca was anaesthetised three months later to re-implant half a 64mg etonogestrel implant for contraception. No visible consequences on lactation, newborn development or the relationship between mother and daughter were observed.

This case confirms that female siamangs can have a fertile cycle shortly after long-term hormonal contraception and it does not affect newborn development. Similar observations were made recently in other populations of gibbons in Europe, especially on *Nomascus sp.*, with the same successes. This selective breeding management approach shows great promise for the EEP.



YOUNG SIAMANG © PARC DE BRANFÉRÉ



Danke schön, Leipzig Zoo

THE EAZA ANNUAL CONFERENCE 2024 FEATURED INSPIRING LECTURES, STUNNING PHOTOGRAPHS AND LIMITLESS ICE CREAM AND PING PONG

Sandrine Camus, Communications Coordinator, EAZA Executive Office

What a week! From 9-12 October, 1,072 delegates from 52 countries and 283 institutions gathered at Leipzig Zoo (Germany) for the EAZA Annual Conference 2024. Together they took part in two Academy courses, five thematic sessions, five plenaries, 12 workshops, 18 social breaks and more than 100 meetings.

We were welcomed by Steffi Lemke, Federal Minister for Environment, Nature Conservation, Nuclear Safety and Consumer Protection; Michael Kretschmer, Prime Minister of Saxony; and Skadi Jennicke, Chair of Board and Deputy Mayor for Cultural Affairs. They all thanked EAZA zoos and aquariums for their conservation efforts and referred to the peaceful revolution that took place in Germany 35 years ago to encourage us to continue

advocating together for our common goal, thriving species on a healthy planet. Jörg Junhold, Leipzig Zoo Director, announced that one tree per delegate will be planted in Saxony to counter the carbon footprint of our conference.

INSPIRING PRESENTATIONS

Keynote speaker, Svante Pääbo, Nobel Prize winner and Director of the Max Planck Institute for Evolutionary Anthropology, talked about our closest evolutionary relatives and how they impact the lives of present-day people, with neanderthal genes linked to sensitivity or resistance to certain viruses, such as COVID-19 and HIV.

We heard updates from the EAZA conservation campaign by the Vietnamizing team, the Director of

the Viet Nature Conservation Centre Pham Tuan Anh and His Excellency Vu Quang Minh, Ambassador in Germany for the Socialist Republic of Vietnam. The campaign plenary ended with a live fundraising session, during which the generous audience donated €55,000!

The Biotech plenary touched on the ethics of cryopreservation. Frank Meijboom, Professor of Sustainable Animal Stewardship at Utrecht University (the Netherlands), discussed the evolving perception of animals and zoos and the concerns around cryopreservation. Congratulations to the EAZA Biobank Working Group for the approval of the EAZA Position Statement on the use of cryopreserved materials and biotechnology. It was introduced to the delegates, followed by a



CLOCKWISE FROM LEFT: THE BEAUTIFUL KONGRESS HALLE; A THOUSAND HAPPY DELEGATES; WORK HARD, PARTY HARDER; THOMAS KAUFFELS RECEIVING HIS AWARD; JOEL SARTORE © EAZA

presentation on the Cryopreservation Interest Group and the new Cryopreservation Network.

Renowned photographer and contributor to *National Geographic* magazine Joel Sartore wowed the delegates with his gorgeous pictures from The Photo Ark, a project dedicated to connecting and reconnecting people with nature and raising awareness of the species living around us before they disappear. We are grateful to have such a friendly and passionate ambassador of the work of good zoos and aquariums.

The EAZA Nutrition Group celebrated its 25th anniversary at the conference with an interactive plenary. Members of the group dismantled the common misconceptions around animal diets, and the keynote by Marcin Przybylo,

Assistant Professor at the University of Agriculture in Krakow (Poland), highlighted the crucial role of natural behaviours when designing diets. The closing play ensured that the audience went home with food for thought.

APPEALS AND ACHIEVEMENTS

After acknowledging our Ukrainian colleagues who need our help to get through the coming winter*, Endre Papp concluded the week by honouring key figures for their significant contribution to our association and to safeguarding species. Our congratulations go to the 2024 Lifetime Achievement Awardees Stewart Muir (Shaldon Wildlife Trust, UK), Achim Johann (NaturZoo Rheine, Germany) and former EAZA Chair Thomas Kauffels (Opel-Zoo, Germany). Thomas also received Honorary EAZA

Membership for his commitment to the Association. Visit www.eaza.net/news to find out more about them and get the full Conference summary.

The picture wouldn't be complete without mentioning the friendly icebreaker, an impressive amount of ice creams provided freely during the week, the ping-pong tournament that took place in the basement to help delegates unwind between meetings, the lovely zoo visit followed by a 'tropical' dinner in Gondwanaland, and the delicious farewell evening where delegates danced the night away.

Thank you, Leipzig Zoo, for your warm welcome and impeccable hosting. See you next year in Orientarium Zoo Łódź (Poland) from 9–13 September!

* Visit www.eaza.net/emergency-fund to find out how you can help.

Partnering with politicians for nature

EAZA'S 2024 MANIFESTO REMINDS POLICYMAKERS ACROSS EUROPE OF THE VITAL ROLE THAT HEALTHY NATURE PLAYS IN THE SOCIAL AND ECONOMIC RESILIENCE OF OUR WORLD

Tomasz Rusek, Director of Advocacy and Communication, EAZA Executive Office

The freshly published EAZA Manifesto 2024 targets politicians and officials at the European Union and national levels. Members of the European Parliament will find a copy in their mailboxes. We encourage staff in EAZA Membership and our partners to read and share the Manifesto in your countries.

Released every five years to coincide with EU elections, the EAZA Manifesto reminds policymakers of the impact of their decisions on the work of progressive zoos and aquariums. The 2024 edition emphasises that nature needs political attention, not only because of its intrinsic value, but also because healthy ecosystems

and thriving wildlife are essential for Europe's resilience amid current geopolitical, social and economic challenges. We can help policymakers by providing four main types of support:

CONNECTING CITIZENS WITH NATURE

Hosting around 148 million visits annually, EAZA Members offer a break from daily stress and improve human wellbeing in an increasingly urbanised world. Members have decades of experience in fostering empathy for nature, educating citizens about the importance of biodiversity and

enriching their countries' conservation education programmes.

Our community also makes a huge socio-economic impact. In 2019 alone, EAZA Members provided more than €3 billion of added value to the economy. This creates more than 46,000 jobs, funds local infrastructure and injects vital resources into conservation, education and research.

SAFEGUARDING A FUTURE FOR ALL SPECIES

EAZA is dedicated to the *ex situ* conservation of wild species and other vital contributions: donating funds and staff time to field projects, capacity building, advocacy and sharing of knowledge. EAZA Ex situ Programmes (EEPs) have enabled Members to build rich expertise in animal care and welfare, management of small populations, preservation of genetic diversity and animal reintroductions. All of this can boost the conservation of European and non-European species, especially if *ex situ* and *in situ* conservation efforts are better integrated.

EAZA also stands against illegal, unsustainable, unsafe and unethical wildlife trade. Members work actively with CITES authorities, rehabilitating seized animals and leading campaigns such as Silent Forest, which focus on





STRONG PUBLIC SUPPORT

Not only the steady visit numbers, rebound in visitor numbers, but also representative public opinion polls confirm strong approval for zoos and aquariums among Europeans.

For example, a 2020 Eurostat study showed that four in five Germans (82%) and Austrians (81%) welcomed the presence of zoos in their countries. Equally many (82% in Germany, 79% in Austria) agreed with zoos being supported from public funds. A vast majority also confirmed that the conservation of biological diversity is a key mission of zoos, both by breeding of threatened species (92% in Germany and 84% in Austria) and through actions outside their zoos (74% in Germany, 82% in Austria). This sentiment is echoed throughout Europe. A recent YouGov survey found that 82% of Irish and 77% of British respondents said that zoos and aquariums in their countries made crucial contributions to conservation.

Source: The Zookeepers and Their Zoos - Results of a Europe-wide 2020 Survey and their Zoos - Results of a France Study 2020, YouGov Ltd & Invertebrate Conservation Survey 2020

SUPPORTING NATIONAL AND LOCAL SOCIO-ECONOMIC GROWTH

EAZA members significantly impact local and national economies as employers and tourist attractions. In 2018, they added €2 billion to the economy. They benefit from public and private investments, donations and funds, including LIFE and other EU grants.

As one of EAZA's main strategic goals, we support Members in reaching their environmental targets and becoming sustainable organisations, aligned with the SDGs and their individual conservation ambitions.

reducing wildlife crime and enhancing species protection. Our efforts are aligned with broader initiatives such as the EU Action Plan against Wildlife Trafficking.

LINKING GLOBAL GOALS WITH LOCAL PRIORITIES

The success of the Kunming-Montreal Global Biodiversity Framework (GBF, also known as the 'Biodiversity Plan for Life on Earth') and European policies depends on national action. We assist in this task through the local work of our Members, a network of affiliated national zoo associations, and EAZA's policy expertise. We help authorities implement the EU Zoos Directive and national zoo licensing legislation as well as national strategies for biodiversity and for nature restoration.

We are committed to strengthening animal welfare inside and outside



EAZA21+

For the past years, in 2022 and 2023, the national EAZA21+ campaigns promote the opportunities coming with the Kunming-Montreal Biodiversity Framework. In particular, Targets 4 and 5 are the most relevant. Target 4 involves EAZA and its Members with a focus on creating a cross-border network of conservation sites leading to improved conservation management and international conservation strategies and policies.

EU LIFE PROGRAMME

The EU LIFE Programme is an indispensable funding tool for conservation, research and more. EAZA Members are involved in LIFE activities in their zoos and aquariums. The LIFE programme also supports EAZA's growth as an organisation.

LIFE helps the EAZA community step up the level of professionalisation projects that protect and reproduce species but also foster international relations between zoos, wildlife and their habitat environments. This includes the field experience not just the EAZA website but the Member's social media.

EU ZOOS DIRECTIVE (COUNCIL DIRECTIVE 1999/22/EC) AND ASSOCIATED NATIONAL LEGISLATION

Along with raising public awareness and ensuring proper animal care, the EU Zoos Directive requires zoos and aquariums to contribute to the conservation of wild animal species through population management and conservation breeding, investigations, scientific research and staff training.

In 2018, the EU found the Directive fit for purpose but in need of better national enforcement. Being part of EAZA and national zoo associations was referred as a factor that helps comply with the Directive. Indeed, EAZA Standards align with the Directive and, in most cases, exceed its requirements.

Improved implementation can help Member States enhance the conservation role of

SOCIO-ECONOMIC IMPACT OF EAZA MEMBER ZOOS AND AQUARIUMS

440 MEMBER INSTITUTIONS

148,000,000 ANNUAL VISITS TO EAZA MEMBER ZOOS AND AQUARIUMS

25,000,000 (17%) VISITS FROM ABROAD

ACROSS 47 COUNTRIES

A map on the EAZA website will help you localize the EAZA Members in your constituency.

Foreign zoo visitors are most prominent in cities that are popular hotspots of international tourism, and in border regions.

AT EAZA'S CORE IS JOINT MANAGEMENT OF ANIMAL POPULATIONS IN EEPs (EAZA EX SITU PROGRAMMES)

Through the EEPs, EAZA contributes to the conservation of species and their genetic diversity and maintains a network of conservation partnerships.

ZOO AND AQUARIUM OWNERSHIP MODELS

36%	46%	18%
OWNED BY MUNICIPALITIES	PRIVATELY OWNED	CHARITY-BASED

65% OF EAZA MEMBER ZOOS AND AQUARIUMS ARE BASED IN CITIES

EVERY YEAR EAZA MEMBERS GENERATE €3 BILLION OF ADDED VALUE INTO THE ECONOMY

PROVIDING WORK TO **46,600** PEOPLE, EMPLOYING **31,500** STAFF AND SUPPORTING **15,100** JOBS INDIRECTLY

READ MORE ABOUT EAZA MEMBERSHIPS ON OUR WEBSITE

the zoo and aquarium sector. EAZA Standards are regularly updated with the latest welfare science, and we promote best practice through courses, events and publications. Our dedication to animal health is best exemplified by the recent publication of the joint EAZA-EAZWV handbook to help state veterinarians apply the EU Animal Health Law in zoos.

FOSTERING COLLABORATION AND SHARING EXPERTISE

EAZA's activities extend across 47 countries and many cultural, socio-economic and legislative dimensions, which gives us unique experience in cross-border collaboration. The EAZA Academy, conferences and other initiatives provide professional training for diverse skills within and outside the zoo community. We also share this knowledge and expertise in support of policy.

Our appeal to policymakers is quite simple: we want to ensure that policies and legislation benefit both nature and the societies that depend on it. We invite you to join forces with us as we strive to help build a more sustainable future, in Europe and beyond.

Explore the Manifesto by following this QR code



Embracing change

THE CENTRAL THEME OF THE 79th WAZA ANNUAL CONFERENCE WAS THE TRANSFORMATION OF THE GLOBAL ZOO AND AQUARIUM COMMUNITY BY 2050

Tania Kahlon, Head of Communications, WAZA

More than 250 global conservation leaders from across the world joined the 79th WAZA Annual Conference at Taronga Zoo Sydney (Australia) in November 2024. The conference theme 'Zoos and Aquariums 3.0: Transforming Zoos and Aquariums for 2050' was the catalyst for generating insightful conversations with colleagues, addressing pressing issues such as species conservation, especially in the context of the recently concluded CBD COP16 in Cali, Colombia.

On the first day, WAZA President Karen Fifield and Taronga Zoo CEO Cameron Kerr shared their opening remarks, in which they welcomed the attendees and highlighted the need to adopt change in light of technological advancements, especially now that artificial intelligence is influencing various aspects of operations. They also addressed urgent issues such as habitat destruction, biosecurity, and species conservation. The keynote address by Nardi Simpson, writer, musician and Yuwaalaraay storyteller, shed light on the need for new approaches to conservation as well as better engagement with First Nations and how we can work with traditional custodians to learn from and protect our environments.

Highlighting the pivotal role of zoos and aquariums in addressing the decline of biodiversity, safeguarding endangered species and as crucial partners in achieving international goals for conservation, the Reverse the Red presentation showcased WAZA members who have signed the WAZA Declaration. This reaffirms their commitment to advancing global conservation through collaborative, strategic, coordinated and measurable actions aimed at halting extinctions, reversing declines and restoring populations.

The second day of the conference saw the keynote address by Adam Spencer, award-winning media and



event host, who continued the theme of AI and the potential ramifications of these cutting-edge technologies for zoos and aquariums. WAZA also signed an MoU with Wild Welfare, to foster and promote a shared commitment to improving welfare for animals in human care.

The keynote speaker for day three was Neshia Ichida, an Indonesian marine conservation scientist, whose expertise includes the taxonomy of reef fish, research on elasmobranchs, marine-protected areas and community-led conservation programmes in Eastern Indonesia. She discussed participation opportunities for zoos and aquariums as well as the ReShark initiative.

The day also saw the recognition of WAZA member associations that met the 2023 Animal Welfare Goal: Associação de Zoológicos e a Aquários do Brasil (AZAB), the British and Irish Association of Zoos and Aquariums (BIAZA), the Southeast Asian Zoos and Aquariums Association (SEAZA) and the Japanese Association of Zoos and Aquariums (JAZA). The WAZA 2023 Animal Welfare Goal aims towards confirming that the Animal Welfare Evaluation Processes used by the WAZA member national and regional associations include specific principles of animal welfare, and thus, to see these principles consistently across WAZA's global membership. On the final day, science communicator Tegan Taylor discussed zoonotic disease biosecurity and how aquariums and zoos can prepare for future challenges in her keynote address. The conference

closed with the Gala Dinner and the awards presentation. Jenny Gray, CEO of Zoos Victoria (Australia) and WAZA President from 2016–2019, was awarded the prestigious Heini Hediger Award. She has pioneered change in animal ethics, welfare and conservation, played a crucial role in initiating Reverse the Red and is a strong advocate of the role that zoos and aquariums can play in empowering visitors to take actions that help wildlife.

The Royal Zoological Society of Scotland was awarded the Conservation Award for reintroducing the Eurasian beaver to Scotland. The two other finalists for the Award were Brookfield Zoo Chicago's Sarasota Dolphin Research Program and Padmaja Naidu Himalayan Zoological Park's Red Panda Conservation Breeding and Augmentation Programme in Singalila National Park and Neora Valley National Park in West Bengal.

The 2024 WAZA Environmental Sustainability Award was awarded to Mandai Wildlife Group (Singapore) for their commitment to work with their supply chain to secure sustainable products, source locally, and reduce packaging used in deliveries. The two other finalists for this prestigious award were Columbus Zoo and Aquarium (USA) and Toronto Zoo (Canada).

We would like to thank everyone who contributed to the success of the conference – the host, Taronga Zoo and all attendees, and we look forward to the 80th WAZA Annual Conference in Cali, Colombia.

Small but mighty

THERE IS GOOD NEWS FOR XENARTHRA AND PHOLIDOTA SPECIES AS NEW CONSERVATION PROGRAMMES AIM TO INCREASE THEIR NUMBERS IN EAZA ZOOS AND IMPROVE THE CHANCES OF THE SPECIES' SURVIVAL

Stewart Muir, Shaldon Wildlife Trust, and Johannes Pfeleiderer, Leipzig Zoo, both EAZA Small Mammal TAG Vice Chairs



The Xenarthra group includes some of the most iconic and recognisable species in public zoos. For most of these species, demand exceeds supply, and there is always a waiting list for institutions wanting to acquire sloths, armadillos and anteaters. We have stable populations of two-toed sloths (*Choloepus didactylus*) and giant anteaters (*Myrmecophaga tridactyla*), along with an increasing number of three-banded armadillos, which have gained significant popularity in recent years. Recently, the EAZA Small Mammal TAG had an excellent meeting with our AZA counterparts to discuss collaborative efforts around shared issues concerning tamanduas.

Some species, however, have declined. For example, there are now only a few Hoffmann's sloths (*Choloepus hoffmanni*) remaining within EAZA, and the screaming armadillo (*ChaetophRACTUS vellerosus*) is now represented by just a single individual in the UK.

The TAG has built strong relationships with *in situ* conservation projects in South and Central America for several Xenarthra species and maintains close ties with the IUCN Xenarthra Specialist Group. The same is true for the IUCN Pangolin Specialist Group (of which this article's author, Stewart Muir, is a member).

Pangolins have always been rare guests in European zoos, even in times of frequent imports from their range countries. Due to their activity patterns and challenges in their nutrition, only a comparably small range of zoos ever tried to keep them and most of them quickly ended their

trials after setbacks, since only a few individuals lived for longer than a few weeks or months.

When Leipzig Zoo (Germany) started to care for Chinese pangolins (*Manis pentadactyla*) in late 2007, fewer than a dozen individuals had been kept – mostly very briefly – at a handful of European zoos during the two previous decades. However, thanks to the intensive ground-breaking work of Taipei Zoo (Taiwan), now an EAZA Associate Member, who have learned how best to care for this species, the preconditions were this time different.

Based on the comprehensive expertise and the detailed advice of Taipei Zoo, especially regarding their supplemental diet, a successful long-term holding of pangolins could be established in Europe. The first male pangolin that arrived at Leipzig in December 2007, a rescued individual from Taiwan, is still alive today, exceeding the previous husbandry record in Europe by almost 10 years. In April 2022, Prague Zoo (Czechia) was the second European zoo to start keeping the species, beginning with a pair from Taipei Zoo. The two individuals have since already successfully bred twice – the

first actual breeding of pangolins in Europe. All previously recorded births were by pregnant imported females and their offspring never survived. At the same time Mandai Wildlife Reserve (Singapore) established the long-term holding of a second species – the Sunda pangolin (*Manis javanica*) – within EAZA.

Led by these champions in pangolin care and conservation, the proposed new-style Pangolin EEP will coordinate both the management of the two species kept *ex situ* and the activities needed to address the conservation and education roles covering all species, in close collaboration with the IUCN Pangolin Specialist Group.

After a lengthy process, the TAG has now published the new Xenarthra and Pangolin Regional Species Plan (RSP), and we are eager to implement the programmes and support *in situ* conservation efforts for this fascinating group of mammals. With the recent approval of the new-style EEP for Two-toed sloths, coordinated by Karoline Albig (Halle Zoo, Germany), the first implementation of a programme proposed in this RSP has already been completed and more are being prepared. Find the RSP on the EAZA Member Area.

The Small Mammal TAG would like to thank **Jutta Heuer** for the excellent work she has contributed to the Vice Chair role over many years, and wish her well in her retirement from Halle Zoo. With her extensive knowledge of the subgroup Xenarthra and Pangolins, Jutta has provided valuable advice and support to many EAZA Members. She has been especially instrumental in the tricky area of sloth sexing, for which she is now widely regarded as an expert. The same gratitude extends to **Ilona Schappert**, who is retiring from Dortmund Zoo (Germany) after many years of overseeing the EEP for Giant anteaters. We wish Ilona a very happy retirement.

Back to the wilderness

A NEW CHAPTER IS BEING WRITTEN IN THE STORY OF THE WILD HORSE, AS PRZEWALSKI'S HORSES RETURN TO THE STEPPES OF KAZAKHSTAN

Miroslav Bobek, CEO, and Barbora Dobiášová, Curator of Mammals, both Prague Zoo

A comprehensive reintroduction programme, led by Prague Zoo (Czechia), has begun in the Altyn Dala region in central Kazakhstan, following the successful series of nine air transports of Przewalski's horses (*Equus przewalskii*) from Prague to Western Mongolia between 2011 and 2019.

While last seen in the wild in the late 1960s in south-western Mongolia, the species probably became extinct in Kazakhstan much earlier, possibly at the end of the 18th century.

The first reintroduction attempts in Kazakhstan took place in 2003 and 2007 with eight and six horses respectively. The horses came from German zoos and were taken to the Altyn Emel National Park in the south of the country. Unfortunately, this initial population had high mortality and low reproduction rates. The import of additional horses was strongly discouraged by experts at the time.

Further efforts thus focused on finding a more suitable location, and attention turned to central Kazakhstan and the vast Torgai Steppe. It was decided to build the infrastructure at a site near the Uly-Zhlaynshyk River close to the abandoned village of Alibi. Two acclimatisation enclosures and an administration building were built more than 10 years ago. However, the preparatory phase of the project made slow progress.

The autumn of 2022 saw a major shift when representatives of Kazakhstan approached Prague Zoo with a request for cooperation on implementing the project. A joint memorandum and an agreement on multilateral cooperation with a number of Kazakh and foreign partner organisations were signed in the spring of 2023 and 2024 respectively. The Committee of Forestry and Wildlife of the Government of Kazakhstan's Ministry of Ecology and Natural Resources, the Association for the Conservation of Biodiversity

of Kazakhstan (ACBK), Frankfurt Zoological Society, Tierpark Berlin, Nuremberg Zoo (all Germany) and Hungary's Hortobágy National Park have committed to further cooperation on the reintroduction programme with Prague Zoo.

After assessing several locations, Altyn Dala was reported to be the most suitable, and preparations began for the first transport of Przewalski's horses from Central Europe, scheduled for the spring of 2024. A key factor was that Prague Zoo received permission to use the Czech Army's CASA C-295M aircraft while only paying the direct costs. This had proven to be highly suitable on a previous occasion for the transport of horses to western Mongolia. This time, however, permission was given to use two aircraft at once, one for the flight from Prague and one for a flight from any other airport in the EU.

In autumn 2023, an abandoned airfield was discovered in Arkalyk; it was 287 km from the reintroduction centre in Alibi and was perfect for landing the aircraft after only minor modifications. Other preparations for transport began, from the authorisation for veterinary medicines to providing cars and accommodation for those involved and even repairing access roads.

As the goal was to establish a completely new population of Przewalski's horses, the import of a larger number of individuals was needed. It was decided to transport eight horses the first year, four in each aircraft. The first aircraft would fly from Prague, the second from Berlin. Tierpark Berlin, working closely with Prague Zoo, helped to prepare the horses in Germany.

During the summer of 2023, the candidates for transport to Kazakhstan were chosen from the EEP population in line with the new LTMP for the Przewalski's horse and considering many factors, such as age (the best candidates are between two and six

years old), health, physical fitness and genetic diversity. The chosen horses were taken to the export points in late 2023 and January 2024.

Four horses from Dolní Dobřejov were loaded into the transport boxes on 3 June 2024, starting at 6 am. Escorted by Czech Police vehicles, the convoy set off for the military airport at Prague-Kbely, 90 km away. A routine check during the journey showed that one male was not doing well in the crate and it was sent back to Prague Zoo. The other three were doing well in the transport boxes to the airport and were loaded on to the military aircraft, which took off shortly before 2.30 pm CEST. After two stopovers, in Istanbul and in Baku, and a total flight time of 15 hours, the plane landed at the provisional airfield in Arkalyk at 8.29 am local time (CEST +3).

After the arrival formalities and the welcome ceremony, the horses were transported by KAMAZ trucks to the

THE FIRST PRZEWALSKI'S HORSES ARE ADJUSTING WELL TO THE LOCAL CONDITIONS IN CENTRAL KAZAKHSTAN



Alibi reintroduction centre. It was originally estimated this would take six to eight hours, but the flood from the April thaw swept through the steppe, severely damaging local roads and even the reintroduction centre. Thanks to our local partners and the preparatory team sent from Prague, everything was back in an acceptable state on time. The first 148 km of the overland transport were along the asphalt road to Amangeldi, and the next 140 km were along an unpaved road, or steppe that had been graded, through the Altyn Dala State Reserve and ending at the acclimatisation enclosures at the Alibi Reintroduction Centre. After an eight and a half hour journey, the horses from Prague arrived at their destination. Having spent 33 hours in the transport boxes, the two females and the male were released into the acclimatisation enclosure on 4 June.

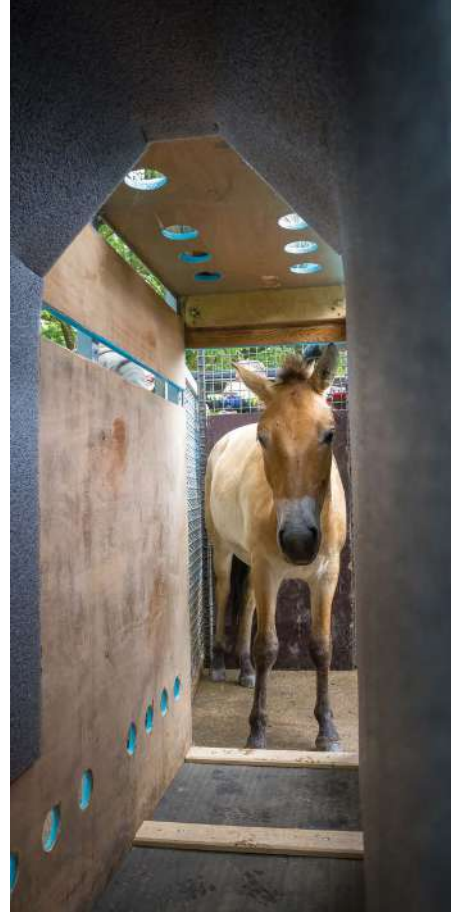
Due to a malfunction of the aircraft, the departure from Berlin was postponed to 5 June. The Berlin team of veterinarians and keepers loaded the four mares at 5.30 am, bearing in mind the scheduled departure at 12.45 pm and the expected delays at the airport. Delayed by the security check, the plane took off at 1.15pm. The flight lasted 15h45 with two

stopovers. During the flight, one female was restless and another showed signs of colic, which were solved with the help of veterinary preparations.

When the flight arrived at Arkalyk at 8 am local time, all the mares were well and could be loaded on to the trucks. The overland transport on roads that had been used before was faster this time and took seven hours. Around 4.30 pm local time, the mares from Berlin were gradually released into the other acclimatisation enclosure.

As soon as the first horses arrived, the local ACBK staff were trained to recognise the horses, care for them during acclimatisation and monitor their overall welfare and their adjustment to the local conditions. As well as monitoring their fitness and health, the dung was regularly sampled to detect possible parasite infections, the horses' behaviour was filmed and the environmental parameters recorded. This data helps to assess how each horse is adapting and whether (and how) to intervene in this process if needed.

A new transport of Przewalski's horses is planned for spring 2025, and others should follow until there are 40 to 50 individuals in Altyn Dala.



RELEASING PRZEWALSKI'S HORSES INTO THE ACCLIMATISATION ENCLOSURES IN ALIBI
© ANNA BERNÁTKOVÁ, PRAGUE ZOO



START OF THE TRANSPORT IN THE EARLY MORNING HOURS – ANAESTHESIA OF THE HORSES AND THEIR VETERINARY EXAMINATION IN DOLNÍ DOBŘEJOV



LOADING THE HORSES IN THEIR TRANSPORT CRATES ON TO THE AIRCRAFT AT THE MILITARY AIRPORT IN PRAGUE-KBELY; UNLOADING THE CRATES AND PLACING THEM ON THE TRUCKS © ALL PICTURES MIROSLAV BOBEK, PRAGUE ZOO UNLESS OTHERWISE INDICATED

The power of the team

HOW INVOLVING ZOOKEEPERS IN THE DECISION-MAKING FOR COLLECTION PLANS CAN IMPROVE BOTH THE PROCESS AND THE CHANCES OF SUCCESS

Kees Groot, former Zoological Assistant, and Maartje de Vries Birds Team lead, both ARTIS Zoo

If there is one subject that always causes a fuss, it is the collection plan. In one zoo, it is an extensive document including a scoring system; in another, the plan exists only in the curators' or directors' heads. Often a collection plan will be developed by curators, in dialogue with the zoo management. This may result in difficult decisions: more space for one species sometimes means having to say farewell to another species. For colleagues, these decisions can sometimes be hard to digest, especially if they haven't been consulted during the decision process. So when ARTIS Zoo (the Netherlands) needed to develop a new plan for its extensive bird collection, the management decided to involve the bird keepers and team lead in the process to ensure as much support for the plan as possible.

STARTING POINT

At the start of process (February 2021), the collection was first analysed according to several parameters, such as the taxonomic distribution, the IUCN Red List status, the participation in EAZA Ex Situ Programmes (EEPs) and the number of species per continent. Taxonomically, 22 of the 41 orders in the class *Aves* were represented and 73 species were present in ARTIS. Forty-two of these were Least Concern species. The status Extinct in the Wild was the least represented, with one species in the collection. In total, ARTIS participated in 28 EEPs, which was 38% of the total collection. The most species (21) were endemic to Europe, followed by Asia (20). The least represented continents were North America (3) and Australia (4). When species had a geographical range extending to two continents (e.g. through migration), they were added to both continents.

The requirements for the future collection were then developed, at first by the author, the bird team lead and the zoological manager. They

were then discussed and amended with the bird team. It was decided that:

- ARTIS will, compared to 2021, house more bird species that are managed through EEPs
- ARTIS will, compared to 2021, house more bird species that are threatened according to the IUCN Red List
- ARTIS will house more bird species that meet the other requirements of the collection plan and are not often housed in Dutch zoos
- Bird species that are housed in a mixed species exhibit should at least come from the same continent
- Every species is assigned at least one clear role in the collection (EEP, Threatened bird species, Attractiveness, Research, Education or Historical)
- The welfare of the bird species in the collection of ARTIS is as optimal as possible
- The collection will focus on species from the continents: Africa, Asia, Europe and Central and South America

HARD DECISIONS

After the requirements were agreed, the entire current collection was evaluated over the course of five meetings. Although extensive, it was a valuable process, allowing all stakeholders to express their opinion about a species or a decision. These discussions mainly arose about species for which we thought we could not offer an optimal level of welfare in the future. For example, we had long discussions about a pair of Hyacinth macaws (*Anodorhynchus hyacinthinus*). Although the species complied with most of the requirements, the majority of the team agreed that, in their current habitat, we could not provide the individuals with the most optimal welfare and there was no more suitable space for them in the zoo. It was thus decided

to transfer the hyacinth macaws to another facility and to no longer include them in the collection. It was a difficult decision for the team, but the right one for the animals. For the evaluation and addition of species, the EAZA Regional Species Plans (RSPs) and EEPs were used as guidelines. Following the RSPs as meticulously as possible ensured that we could contribute as extensively to the different EEPs as substantially feasible.

The evaluation showed that the majority of the species would remain in the collection (58), of which some would move internally to different habitats, and 15 species would not be included in the new species plan (i.e. they would be transferred to other zoos or phased out). These changes need a significant amount of time to be executed, but everyone involved knows what to expect in the years to come.

THE PLAN FOR 2030

Following these decisions, there were several aviaries in need of additional species. Another series of meetings resulted in the decision to add at least 16 new bird species to the collection in the coming years, including the Endangered Sumatran laughingthrush (*Garrulax bicolor*) and the Vulnerable lesser white-fronted goose (*Anser erythropus*) that were added in 2022.

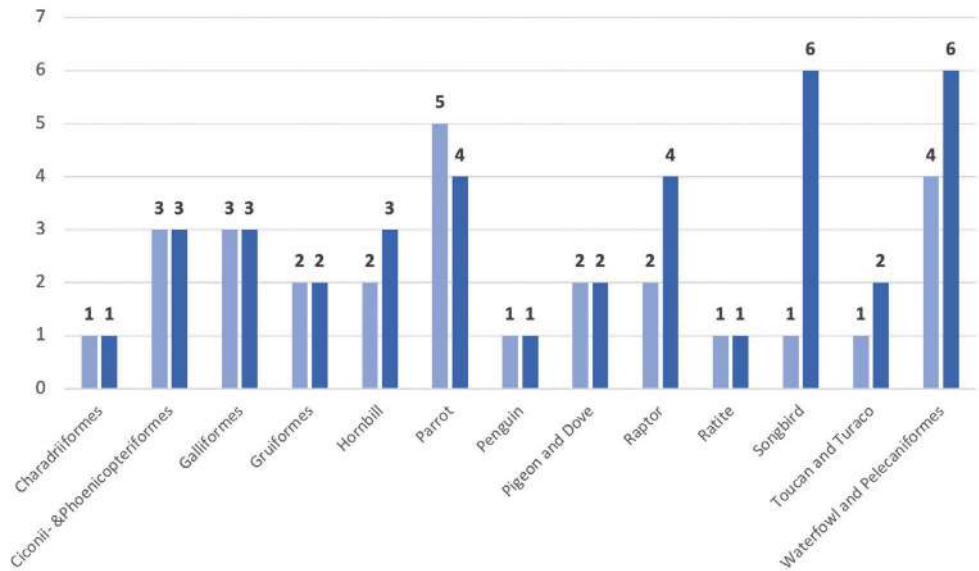
The desired species plan of ARTIS Zoo will include, by 2030, seven Critically Endangered, nine Endangered and 11 Vulnerable species; that is to say, 36% of the species are classified as threatened and fewer Least Concern species are included. ARTIS will participate in 11 additional EEPs in the future, meaning that 49% of the bird species will be managed through an EEP (Figure 1). The collection will increase the number of species that occur in Europe, Asia, Africa and South America (Figure 2).

WHAT NEXT?

Eventually, the process resulted in the development of the bird collection plan ARTIS 2030, an extensive document that includes a description of the roles of each species and the reasons for inclusion in the plan (Figure 3), as well as an overview of species, sex ratio and management

FIGURE 1. COMPARISON OF THE NUMBER OF EEPs IN WHICH ARTIS PARTICIPATES BETWEEN 2021 AND 2030

■ EEPs in which ARTIS participates in 2021
 ■ EEPs in which ARTIS participates in 2030



form (for example EEP) per enclosure. As a result, the zoo will have a clear guideline for the changes to occur in the coming years, which are supported by the entire team.

Over the past two years, the bird team has been implementing the first changes described in the plan, causing unforeseen activity and changes in workload in the bird department. The addition of new species meant a busier breeding season, additional transfers and catch-ups compared to the years before. Therefore, every year after the breeding season, the plan is re-evaluated with the team to discuss the actions needed to implement the plan or changes required due to new insights. The collection plan will remain a dynamic document, adapting to the latest insights into animal welfare, conservation and population management.

LESSONS LEARNED

The species planning process was evaluated with all stakeholders. The majority of them indicated that they felt heard during the process and were able to freely express their opinion and that this approach was a valuable experience for them. Following this positive feedback, ARTIS Zoo decided to start a species plan for the Ectotherms using a similar process.

Feel free to contact Kees Groot (kees.groot@live.nl) or Maartje de Vries (m.devries@artis.nl) for any questions about the process of collection planning or the operational side of the collection changes respectively.

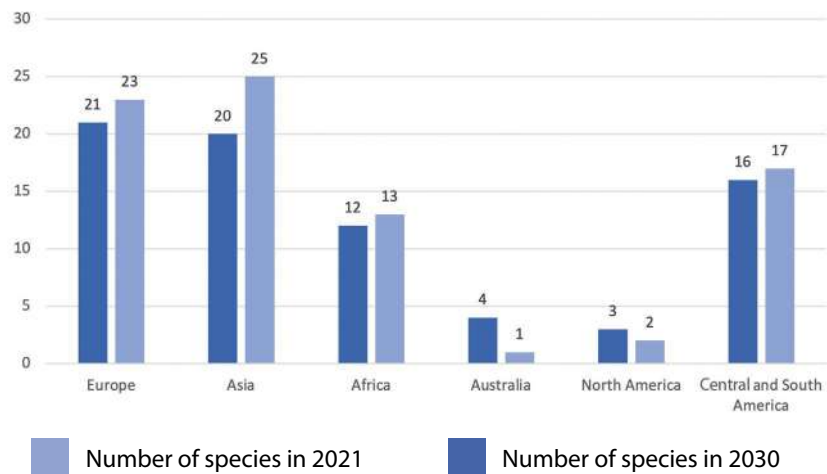


FIGURE 2. COMPARISONS OF NUMBER OF BIRD SPECIES PER CONTINENT IN ARTIS BETWEEN 2021 AND 2030

SUMATRAN LAUGHINGTHRUSH (*Garrulax bicolor*) EN/EEP

Purpose of the species within ARTIS

- Threatened bird species
- EAZA Ex Situ Programme
- Education



BURN, 2020

The Sumatran laughingthrush has been assigned the following roles within the collection:

- **Threatened bird species**, the species is classified as 'Endangered' by the IUCN
- **EAZA Ex Situ Programme**, the species is managed through an EAZA Ex Situ Programme by the European Association of Zoos and Aquaria
- **Education**, the species is threatened and is attractive to visitors, therefore the species has educational value for the collection.

FIGURE 3. AN EXAMPLE OF A SPECIES PROFILE IN THE BIRD COLLECTION PLAN ARTIS 2030

Flight plan

HOW CONSERVATION ORGANISATIONS ARE JOINING FORCES TO REINTRODUCE THE EUROPEAN NORTHERN BALD IBIS

Miguel A. Quevedo, Veterinary Adviser for the Northern Bald Ibis EEP and Iñigo Sanchez, Curator, both Jerez Zoo

The northern bald ibis (*Geronticus eremita*) is listed as an Endangered species, with a single wild population of about 750 birds and 120 breeding pairs located on the Atlantic coast of Morocco. Historically, the species was distributed throughout the Middle East, North Africa, and central and southern Europe. Habitat destruction, pesticide use and direct persecution have led to the species' extinction in much of its former range. In Europe, the species disappeared approximately 400 years ago.

From a conservation perspective, it was crucial to prioritise *in situ* conservation efforts to ensure the survival of the last extant population in Morocco. However, experts also deemed it essential to establish new populations in other countries using birds born in human care. EAZA maintains a significant population of northern bald ibises managed through an EEP. Over the last 20 years, two reintroduction projects have been developed in Europe: Proyecto Eremita in southern Spain and the LIFE-Northern Bald Ibis (NBI) Project in central Europe. Both projects are

supported by dozens of EAZA zoos and aim to establish viable, self-sustaining populations. The key difference is that the Spanish population is sedentary while the central European population is migratory, since the species bases its diet on large invertebrates that do not survive the harsh winter climate.

Proyecto Eremita, launched in 2004 through a collaboration between Jerez Zoo (Spain) and the Ministry of the Environment of the Junta de Andalucía, has established a population of about 300 birds with 33 breeding pairs spread across three colonies in the La Janda region of Cadiz, Andalusia. While this population is currently stable and sedentary, it needs to grow to about 350 individuals to achieve long-term self-sufficiency. Between 25 and 40 birds are released annually from an acclimatisation aviary in San Ambrosio, Barbate. These birds integrate quickly with the wild population.

Meanwhile, the central European project, run by the Waldrappteam and partners, consists of representatives from Austria, Germany, Italy and Switzerland. Their goal is to establish a migratory population. The project

is currently managed through an EU LIFE programme, led by Vienna Zoo (Austria). Since 2002, birds from the EEP have been released, forming several breeding nuclei in Austria and Germany. After breeding, these birds migrate across the Alps to Italy. One notable aspect of the Waldrappteam's work is the technique used to teach juveniles to migrate. The 'human-guided migration' involves hand-rearing chicks so that they imprint on humans, whom they consider foster parents. The birds then follow ultralight aircraft piloted by their 'parents' to their wintering grounds in Italy.

The central European population now includes about 250 birds, four breeding colonies and around 30 pairs. Since 2011, the number of adults migrating from their breeding sites in central Europe to wintering grounds in Tuscany has increased. Wild-born juveniles join adults on their journey south, learning the migratory route naturally. However, in 2022, only five of the birds that hatched in the three breeding colonies north of the Alps made it to the wintering grounds on their own. Fifty-five birds repeatedly



HUMAN-LED MIGRATION
© WALDRAPPTTEAM

attempted to cross the northern Alps but failed. Ultimately it was decided to capture the remaining birds in late November and transport them by vehicle south of the mountain range, where they were released to continue their migration independently. This concerning situation seemed to be due to climate change affecting the birds' migratory route. It was observed that over the past 12 years, the start of migration had been delayed due to mild autumn weather. Initially, the birds began crossing the Alps in early October, but by last year, they did not do so until late October or early November, when there were no more thermals to help them ascend over the Alpine range.

The ibises in the central European population north of the Alps clearly faced a serious challenge. An unexpected situation also caught the Waldrappteam's attention. Ingrid, a male hatched in 2022 in Rosegg Park, Austria, and hand-reared by foster parent Helena Wehner, was guided by microlights along with other ibises crossing the Alps on the migration route to Italy. During the

journey, Ingrid got separated from the group and was lost from sight on 24 August, just before the group crossed the mountains. Thanks to the GPS transmitter attached to the bird, his route could be tracked. Ingrid flew west, crossed central Europe and then headed southwest along the Mediterranean coast, eventually reaching Cártama, Malaga (Andalusia), where he stayed for several months.

In response to Ingrid's unexpected south-westward journey and the difficulties some birds in the central European population faced in crossing the Alps to Italy, the Waldrappteam organised a technical meeting in Vienna with the other European NBI project in December 2022. They shared the latest developments, results and experiences of both reintroduction projects. As a result, the relationship between the two projects was strengthened and a new migratory route was planned. Ultralight aircrafts would guide the group of ibises from Europe to Andalusia, bypassing the Alps and establishing a new wintering area in La Janda, Cadiz. It is hoped that the birds will find this new route more favourable and that they will coexist with the establish sedentary population in Andalusia. While it is expected that the birds will return to their colonies in the Alps the following spring due to their philopatric nature, some may choose to stay in Andalusia or take young birds from the Andalusian population with them on their migration. This could result in an interesting genetic exchange between the two European populations.

Apart from Ingrid's case, another interesting event occurred the following winter (2023). In the Janda region, a few kilometres from the ibis release aviary in Cadiz, an isolated bird

was observed with identifying rings different from those used in Proyecto Eremita. Male 680 was identified as 'Fiete' and had hatched in the wild in the German colony of Überlinguer in the spring of 2023. He had embarked on a solo journey southwest. Since this bird did not carry a GPS tracker, its exact route is unknown, but it likely followed a similar path to Ingrid's. A month later, Fiete joined the Eremita Project's group of ibises and continues to live with them in the area. This event further supports the idea that establishing a migratory route linking the two European populations would be promising.

To achieve the new migration route between central Europe and Cadiz, a group of 35 hand-reared juveniles were guided on 21 August 2023 for the first time from Baden-Württemberg (Germany) over 2,300 km to Andalusia to integrate with the local population. They reached Cadiz on 3 October after a 43-day journey, with only three birds getting lost along the way. The birds were confined in the Proyecto Eremita acclimatisation aviary until December when they were released and integrated into the local population. In autumn 2024, a second group of 36 birds has been guided by ultralight from Bavaria to Cadiz, undertaking a 2,800 km journey. The same methodology will be used in future years to establish a migratory tradition between the two European populations. The northern foothills of the Alps offer favourable feeding and breeding areas for the species, while Andalusia, although facing seasonal food shortages, provides an excellent year-round habitat. This symbiosis between the two populations offers a promising future for the conservation of this species in Europe and we look forward to monitoring the results.



MIXED GROUP OF CENTRAL EUROPEAN AND
ANDALUSIAN BIRDS FEEDING IN THE LA JANDA
REGION © CHUSS FERNÁNDEZ

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Making waves

ADVANCING OCEAN LITERACY THROUGH CONSERVATION EDUCATION

Ania Brown, Consultant, EAZA Executive Office

Understanding how humans impact the oceans and, in turn, how the ocean influences our lives, is at the heart of what 'ocean literacy' means. It is the knowledge, skills and attitudes needed to make informed decisions about how we interact with the marine environment. This concept is built around seven key principles that aim to educate and raise awareness of 'blue issues', the critical challenges facing our oceans, such as the impacts of climate change, marine pollution and loss of biodiversity. This framework also aims to foster a deeper connection between people, the ocean and its resources.

The seven principles emphasise that Earth has one big ocean, with many parameters and a diverse life that shapes the features of Earth, including making it habitable for life as we know it. The ocean is a major influence on climate and weather and supports many ecosystems. We are inextricably connected, the ocean and us, and yet it remains largely unexplored. By highlighting the interconnectedness of our oceans, its marine life and its importance in all of Earth's processes and systems, we can start to truly understand the impact that human activities have on global marine environments.

Climate change, pollution, overfishing and altered habitat use and destruction are only some of the growing environmental challenges that we face globally. In order to advocate for marine resources and implement sustainable practices, there is a greater need for a well-informed public. Ocean literacy can serve as an educational framework that empowers individuals and communities to learn about, and engage with, these issues in efforts to influence policy and to protect marine ecosystems.

Zoos and aquariums occupy a unique position in the effort to promote ocean literacy. As institutions dedicated to the conservation of wildlife, they serve as powerful

platforms for public education and engagement. Furthermore, through collaborations with researchers and conservationists, zoos and aquariums can be a bridge between the scientific community and the public, facilitating the dissemination of new discoveries, cutting-edge research and conservation strategies. Our institutions have long been hubs of knowledge and action for conservation. Through exhibits, educational programmes and outreach initiatives, they are well-positioned to lead the charge in ocean literacy efforts.

Zoo and aquarium educators are critical to these efforts. As the frontline of public-facing communicators, they can help to translate complex marine science into relatable and accessible concepts for visitors of all ages. Through the use of carefully designed, interactive exhibits, hands-on activities and storytelling, educators can engage broad audiences and help them to understand the significance of the ocean and its connection to their daily lives and inspire them to take action in protecting it. Ocean literacy is not just about understanding the science; it's about cultivating a sense of stewardship and responsibility for the health of our oceans and fostering a global community that understands, values and cares for the ocean.

Already, the [EU4Oceans Coalition](#), a dynamic initiative aimed at enhancing ocean literacy across Europe, is bringing together a diverse network of individuals, organisations and institutions, including EAZA and EAZA Member Nausicaa (France), all working towards the common goal of increasing public awareness and engagement with marine issues. This coalition leverages multiple platforms to emphasise the importance of these issues, aiming to inspire action at both the individual and collective levels.

In doing our part, EAZA is dedicated to facilitating the

A Deeper Dive:
OCEAN LITERACY IN YOUR ZOO OR AQUARIUM
An EAZA Academy Workshop

This one day, in-person course is designed to deepen your understanding of ocean literacy principles and the science behind our oceans' most pressing challenges. The course is intended for zoos as well as aquariums as ocean literacy issues touch us all and have direct impact upon climate change, ocean health and healthy environments. Building on the foundation from our online course (launching end of 2024), this advanced training focuses on:

- 1** Ocean Literacy Principles & Blue Issues: Dive into the scientific principles of ocean literacy exploring current 'blue issues' like climate change, biodiversity loss, and plastic pollution. Gain insights into the latest ocean science to help you connect visitors with the most urgent topics in ocean conservation.
- 2** Educator's Toolkit Module: Equip yourself with a comprehensive toolkit filled with valuable resources, activities, and best practices to support your role as an ocean literacy ambassador.
- 3** Case Studies on Current Ocean Conservation Topics: Engage with real-world case studies on pressing conservation efforts, gaining awareness of global and local initiatives that can inspire your approach to public education.
- 4** Storytelling & Engagement Strategies: Discover advanced techniques in storytelling, visitor engagement, and program development to make ocean science accessible and impactful for a wide range of audiences.
- 5** Program Development for Ocean Literacy Impact: Deepen your ability to design programs and exhibits that encourage visitor action and environmental stewardship within zoo and aquarium contexts.

WHEN? 17 March 2025, 9:00 - 16:30
Prior to the EAZA Conservation Education Conference Icebreaker

WHERE? Hosted by Chester Zoo, United Kingdom
EAZA Education Conference CHESTER ZOO 17 - 21 March 2025

HOW? To register for this workshop, scan the QR or visit the [EAZA Education Conference 2025 webpage](#), register for the EAZA Education Conference, where you will be asked if you would like to also register for this workshop.
Workshop Registration - €145.00 (EAZA Members) €179.00 (non-EAZA Members)

engagement of our community with ocean-related topics. At our Annual Conference, an introductory session took place to gather suggestions and needs from our Members to be included in the new self-directed course on ocean literacy and blue issues developed by the EAZA Academy. To be released by the end of 2024, this course will cover what ocean literacy is and why and how it should be incorporated into educational programming in our institutions. It will provide additional resources in support of this effort. If you prefer in-person training, the first EAZA Academy workshop on ocean literacy will take place at the next [EAZA Conservation Education Conference](#), hosted by Chester Zoo (UK) from 17–21 March 2025.

As threats to marine environments intensify, this work becomes increasingly critical. Thanks to these resources, we can all dive in together to advance ocean literacy and encourage sustainable behaviours to ensure a healthy future for our oceans and all who depend on them.



CONTRIBUTIONS TO CONSERVATION

TOTAL SUPPORT 2023

i Based on information available in the EAZA Conservation Database on 15 May 2024



138,760 HRS
STAFF TIME



€29.4 MILLION



206
MEMBERS

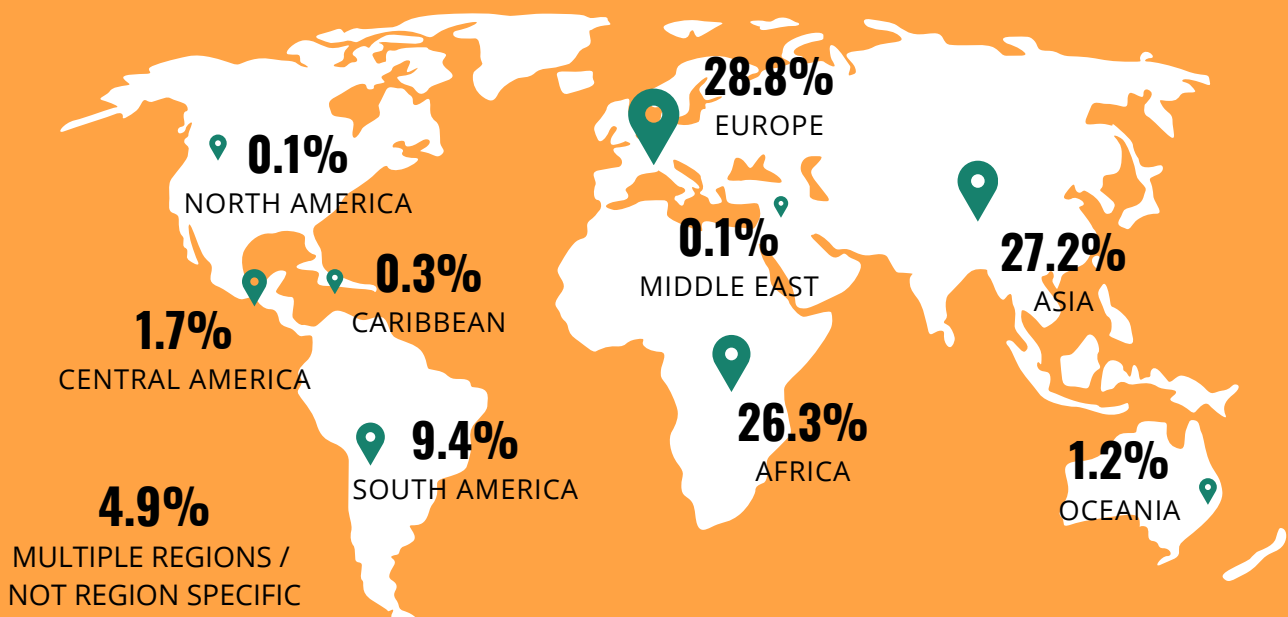


>500
PARTNERS



>800
SPECIES

AREAS OF FINANCIAL SUPPORT



**includes plant, habitat conservation, conservation tool development*

Progressive Zoos and Aquariums Saving Species Together With You



CONTRIBUTIONS TO CONSERVATION

TOTAL SUPPORT 2019 - 2023

i Based on information available in the EAZA Conservation Database on 15 May 2024



301

MEMBERS



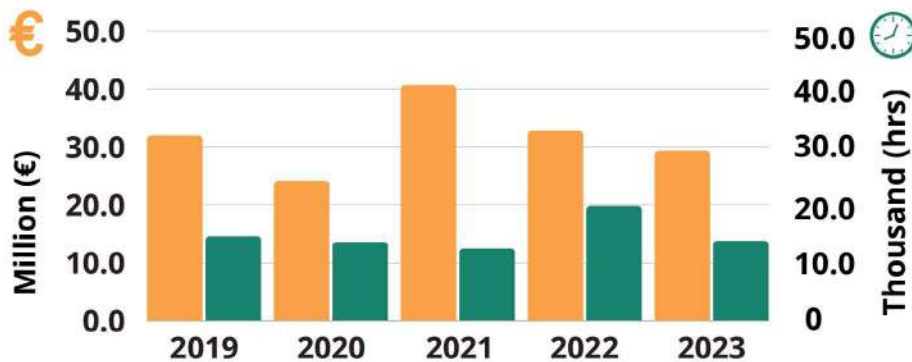
>1000

PARTNERS



>1000

SPECIES



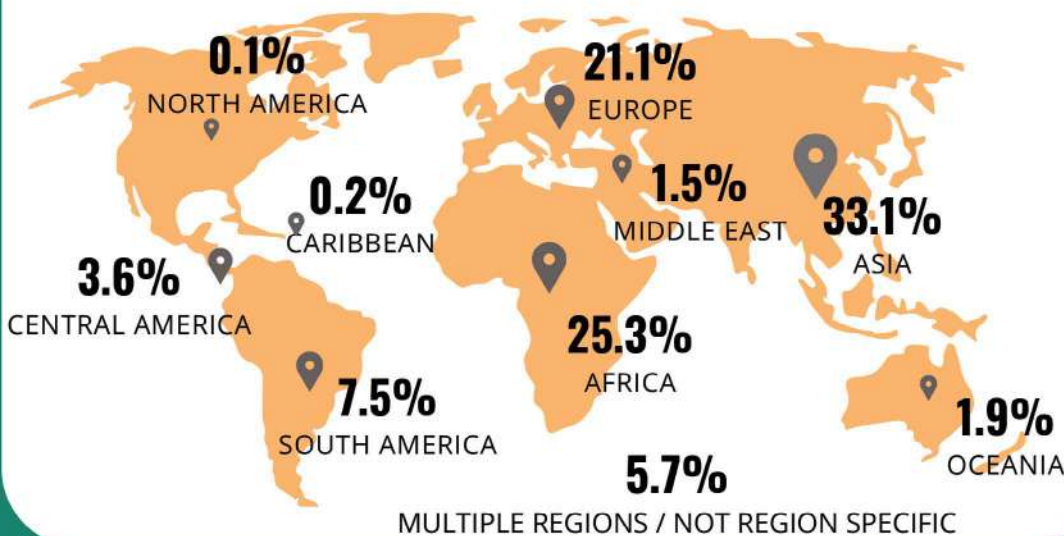
€ 159 MILLION

FINANCIAL SUPPORT



683,776 HRS

STAFF TIME



TOP 5 TAXA SPECIFIC SUPPORT



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LET'S MEET IN 2025!



EUROPEAN ZOO NUTRITION CONFERENCE



23-26 January, Apenheul

17-21 March, Chester Zoo

EAZA Education Conference
CHESTER ZOO
17 - 21 March 2025

EAZA EDUCATION CONFERENCE

EAZA DIRECTORS' DAYS



1-3 April, Oceanogràfic Valencia

9-13 September



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Bridging genetic research and policy

EAZA HAS JOINED GENOA, AN EU-FUNDED PROJECT FOR BETTER IMPLEMENTING GENETIC DIVERSITY DATA AND INDICATORS ACROSS EUROPEAN COUNTRIES

Alice Albertini, EU Policy Coordinator, EAZA Executive Office

GENOA is a new four-year project uniting partners from 34 countries, including EAZA Members Antwerp Zoo (Belgium) and Copenhagen Zoo (Denmark), and EAZA as a secondary partner. Funded under the European COST Action programme, GENOA promotes pan-European interdisciplinary research networks. It aims to refine, assess, inform and facilitate the implementation of genetic diversity data and indicators across European countries, by engaging with practitioners, companies, policymakers and the wider public. It builds on the previous Genomic Biodiversity Knowledge for Resilient Ecosystems (G-BIKE) COST action, which played a key role in advocating for the acknowledgment of genetic diversity in the Kunming-Montreal Global Biodiversity Framework (GBF).

Christina Hvilsom, EAZA Biobank Working Group Chair and Researcher (Copenhagen Zoo) and **Peter Galbusera**, Researcher (Antwerp Zoo) talked to Alice Albertini about GENOA's ambitions, which are vital not only to the success of the project but also to others in the EAZA community, particularly those working with genetic diversity and/or interested in contributing to their country's National Biodiversity Strategies and Action Plans (NBSAPs).

AA: How does GENOA expand on G-BIKE's achievements and methodologies?

PG: G-BIKE sought to unite people around the importance of genetic diversity as a key component of biodiversity. One of its biggest achievements was through the GBF. GENOA builds on this by aiming to assist national reporters in fulfilling the genetic diversity reporting requirements outlined in the NBSAPs. In addition, GENOA is focused on improving communication both within its working groups and externally, and has established a dedicated dissemination committee to enhance outreach efforts.

AA: One of the key objectives of GENOA is to improve and create tools that make genetic diversity indicator implementation accessible for non-experts. How will you ensure that these tools remain both user-friendly and scientifically sound?

CH: Non-experts will come with various backgrounds, expertise, skills and needs. To tailor the tools accordingly, we are bringing together GENOA experts and the non-experts to create methods and workflows that are scientifically sound, appropriate and achievable for non-experts. Using knowledge outcomes from our EU Biodiversa+ project GINAMO (Genetic Indicators for Nature Monitoring), in which we adhere to the IUCN SSC CPSG's principles and steps in our co-creation process with five EU countries, we will employ stakeholder-inclusive processes to facilitate uptake and use of the genetic diversity indicators. This pan-European work won't be completed within GENOA's timeframe, but the foundation, framework and country knowledge hubs will be established to continue the work beyond GENOA.



GENOA'S MANAGEMENT COMMITTEE KICKS OFF IN BRUSSELS, OCTOBER 2024 © GENOA

SCAN THE QR CODE TO LEARN MORE ABOUT THIS COST ACTION

AA: GENOA aims to engage young people by connecting with youth movements focused on climate change, conservation and social justice. Which GENOA themes will resonate most with young people?

PG: Younger generations are very open to diversity, as seen in their strong advocacy for gender diversity. While they push for big societal changes, they also care deeply about their local communities. Genetic diversity can empower both individuals and communities by linking local actions to global impacts. GENOA aims to engage young people by showing how genetic diversity helps build resilient ecosystems, which in turn support healthy communities and sustainable livelihoods.

AA: Both of you have extensive experience in securing EU-funded projects. What advice would you give the EAZA community on crafting biodiversity and conservation grant proposals?

CH: Explore synergies and collaborations! Successful proposals often involve diverse partners, even from outside usual fields. Bringing together varied expertise leads to strong, funder-appealing proposals. If you have a project idea, then start exploring collaborations, find relevant calls and draft the proposal together, to ensure everyone is included and buys in on the project proposal.

PG: Keep trying! Writing proposals is time-intensive, and competition is tough, but each attempt improves your chances. Building a reliable consortium of partners is crucial. Both Antwerp and Copenhagen Zoos have been networking with partners for over 15 years, through conferences and shared publications, which helped us succeed with projects like G-BIKE, GENOA, and GINAMO.

Whether you are involved in genetic diversity research or willing to contribute to national biodiversity strategies, stay tuned for updates on how our Members and EAZA contribute to strengthening the connection between science and policy.



Better diet, better welfare

© EAZA

THE EUROPEAN ZOO NUTRITION GROUP IS CELEBRATING TWENTY-FIVE YEARS OF ADVANCING ZOO ANIMAL WELFARE THROUGH NUTRITION

Sarah Byrne, Dublin Zoo, and Lauren Samet, Marwell Wildlife, co-Chairs of the European Zoo Nutrition Group

This year marks the 25th anniversary of the European Zoo Nutrition Group (ENG), a pivotal moment that underscores decades of dedication, collaboration, research and innovation in zoo animal nutrition. Founded in 1999, the ENG was established with a singular vision: to create a supportive community of zoo nutritionists and professionals committed to enhancing the health, welfare and longevity of animals in human care through research, education and the promotion of best practices in nutrition. Since then, the ENG has aided in the transformation of how we feed exotic species and advanced the field of zoo animal nutrition.

THE IMPORTANCE OF NUTRITION IN ANIMAL WELFARE

The role of nutrition in the welfare of zoo animals cannot be overstated. Proper dietary management is essential for the health of the diverse species found in zoos and aquariums, from mammals and fish to reptiles and invertebrates. For many species, the nutritional requirements in

human care differ from those in the wild due to many factors, not least the availability of wild ingredients. With collaboration, research and dedication, ENG's members help to overcome these obstacles by providing information and expertise on balancing diets for optimum nutrition, Best Practice Guidelines for feeding, and research into diverse and complex species.

Over the years, EAZA and ENG members have facilitated major advancements in the nutritional science of exotic species by focusing on collaborative research and education. By creating this network of experts, the ENG has played a critical role in transforming the nutritional practices of zoos across Europe and beyond.

OUR MISSION AND VISION

From the outset, the ENG aimed to enhance the welfare of zoo animals through improved nutritional practices. The group envisioned a future where zoo nutrition would be based on scientific research and

practical applications tailored to the needs of different species. Our mission included:

- 1 **Fostering collaboration:** creating a network for and of professionals to share expertise and resources
- 2 **Promoting research:** encouraging scientific studies related to zoo animal nutrition and welfare
- 3 **Educating professionals:** providing training and resources for zoo staff and nutritionists
- 4 **Setting standards:** developing guidelines for best practices in zoo animal nutrition

HUMBLE BEGINNINGS

The ENG began as a small group of dedicated professionals, united by their passion for animal nutrition and welfare and their recognition of the need for a supportive community. The founding members saw the potential for sharing knowledge and resources among zoo nutritionists, veterinarians and researchers. This collective approach has led to significant breakthroughs in understanding the specific dietary

needs of various species and has allowed for the development of tailored feeding programmes that have improved the health and longevity of animals in human care. They ultimately partnered with EAZA to achieve a combined goal of maintaining optimal nutrition in European zoos and aquariums.

CONFERENCES AND EDUCATION

One of the most significant contributions of the ENG has been its series of conferences, which have brought together professionals from across Europe and the wider global zoo community, enabling them to share research findings, discuss challenges and promote best practices. An EAZA Academy workshop generally takes place before the conference and helps to facilitate the practical implementation of leading zoo nutrition management. The 13th European Zoo Nutrition Conference is set to take place in Apeneul (the Netherlands) in 2025, promising to continue this tradition of knowledge exchange and community building. (For more information, see www.eaza.net/events.)

PUBLICATIONS AND KNOWLEDGE SHARING

The ENG has also published numerous resources to further disseminate knowledge within the community, including four compilations of research papers written by various ENG members and conference speakers – valuable references for professionals seeking to enhance their understanding of zoo animal nutrition. Moreover, the ENG has released seven editions of *Nutrition News*. These publications highlight the latest developments, research findings and practical tips for zoo nutritionists, helping to establish a body of knowledge accessible to professionals at all levels. We are planning to develop a large database of nutrition materials available to all via the EAZA Member Area.

WORKSHOPS AND TRAINING

The ENG has facilitated numerous workshops on diverse topics from dietary management strategies

to specific species' nutritional needs. These hands-on learning opportunities enable zoo professionals to gain practical skills and insights directly applicable to their work, and foster a culture of continuous learning within the community. Be ready for another great EAZA Academy instalment coming to Apeneul for the Nutrition Conference 2025. We will be learning the intricacies of the Zoo Diet Navigator Free Nutrition Software from its creator, Heidi Bissel, herself! ENG members have also been involved in presenting at various TAG meetings and several Welfare Webinars over the years. At the EAZA Annual Conference 2024, we presented research and species-specific nutrition guidelines at nine TAG meetings. Get in touch if you'd like the ENG to present at future TAG meetings.

THE ENG FUND

In 2023, the ENG Fund was established to support innovative projects in zoo nutrition. This initiative has already funded four exciting projects, showcasing the group's commitment to advancing research and practice in the field. The ENG Fund is a testament to the ENG's proactive approach to addressing emerging challenges in zoo nutrition and ensuring that the latest science informs dietary practices. We look forward to celebrating the completion of these assisted studies and the implementation of their findings.

BUILDING A COMMUNITY

Beyond research and education, the ENG has fostered a friendly and sociable community, creating friendships among its members and a supportive environment that encourages collaboration and sharing of ideas. The @EAZAnutrition Facebook page (with nearly 4,000 followers) serves as a platform for sharing job vacancies, research and events in the zoo nutrition world, further strengthening global connections.

The small group has grown into a vibrant community, attracting members from various sectors, including academia, veterinary

medicine and zoo management. This expansion reflects the increasing recognition of the importance of nutrition in the overall care and welfare of zoo animals.

The ENG has also fostered international connections beyond Europe with members from as far away as Singapore and Hong Kong, and is discussing closer ties and collaborations with our international counterparts (AZA). This global perspective has enriched the group's activities and broadened its impact on wildlife care.

WHAT'S NEXT?

With emerging health issues and the impacts of climate change on wildlife, the ENG is poised to adapt its research focus to address emerging diet-related challenges. It is important that EAZA collections understand how these factors influence the nutritional needs of animals in their care and ensure that best practices evolve in response. Sustainably and ethically produced diet ingredients will have a positive global impact.

The ENG will continue to enhance and expand our educational initiatives, providing more training resources and workshops for zoo and wildlife professionals. This commitment ensures that current and future generations of zoo staff are equipped with the knowledge and skills necessary to optimise animal nutrition. We recognise that the field of zoo animal nutrition is constantly evolving, and we aim to stay at the forefront of this progress.

The 25th anniversary of the European Zoo Nutrition Group is not merely a celebration of our history; it is a recognition of the ongoing dedication of our voluntary members to improving the welfare of zoo animals through science and collaboration. The ENG's achievements over the past quarter-century have not only transformed the field of zoo animal nutrition, but also set a standard for excellence in animal care. We take the opportunity here to thank all of our members, past and present, for making the group as impactful as it is. Here's to the next 25 years of progress, partnership and passion!



Kitchen secrets

AMERSFOORT ZOO'S NEW CENTRALISED KITCHEN IS NOT ONLY PROVIDING OPTIMAL NUTRITION FOR ITS ANIMALS, BUT ALSO EDUCATING ITS VISITORS

ALL PHOTOS © JESSIE KAMP

Anouk Fens, Nutritionist, Amersfoort Zoo

At Amersfoort Zoo (the Netherlands), more than 100 animal species, ranging from millipede to rhinoceros, are provided with a nutritionally balanced diet. Each one receives a diet specially formulated to fulfil its nutritional needs and stimulate its natural feeding and foraging behaviour. Visitors often wonder what the animals are fed with and who prepares the meals, so a year ago, the brand new Zoo Commissary, a large centralised kitchen, opened its doors at Amersfoort Zoo, giving visitors the opportunity to find out what it takes to feed our residents in a healthy way.

MODERN AND EFFICIENT

Until recent years, our zookeepers were responsible for preparing the diets of the animals under their care. The food was prepared in several different buildings accessible to keepers from different departments, which was not ideal in terms of hygiene management. We wanted to develop a modern, centralised commissary to improve efficiency, waste reduction, hygiene and animal welfare. The recent global pandemic also increased our focus on preventing cross-department contamination.

The design of the building, both inside and outside, was the result of a two-year assessment of the need for work spaces, storage rooms, food and staff safety and visibility for the public. Many questions about the commissary

operation had to be answered: 'What are the quantities of different products used weekly?' 'Is space needed for storage of browse?' 'How will diets be packaged and transported to the animals?' 'How much space is needed to store prepared diets?' 'How will meat, fish and prey items be thawed?' 'How will empty dishes be returned to the commissary?' and so on.

The final design was determined by the number and types of diet prepared, the daily routine of the staff and the ability for the public to view our operation. Large, separate work areas to prepare meat, fish and animal prey became the heart of the design. Staff members enter the building opposite to the public entrance through a 'central square', which prevents them from walking directly into food areas. This central area also

serves as a buffer zone when moving from one work space to another (for example, between the 'produce' and 'meat' zones). Moreover, the coolers and storage rooms have inside and outside access points (with a door to the loading area used by suppliers) to prevent contamination.

Another important factor to consider was sustainability. To minimise energy consumption, we use a heat pump providing both heating and cooling, as well as energy-efficient coolers and freezers. In addition, rain water is efficiently drained and stored. As Amersfoort Zoo is located in the middle of a large forest area, the exterior of the building has been designed with respect to nature. We aim to increase biodiversity by use of a large sedum roof, the incorporation of several nest boxes for bird and bat



species and the development of an insect hotel along the visitor path leading towards the commissary.

Finally, in December 2023, Amersfoort Zoo opened the brand new centralised commissary: a 515 m² building, of which about 20% is dedicated as a public area. The commissary is located on the ground floor of the building, with an additional storage space in the cellar and office space on the first floor. The new building not only is key to our daily dietary operation, but also plays a large role in educating our visitors. The fact that visitors can enter the building and observe the staff through windows, without disturbing them or increasing hygiene risks, is quite unique within European zoos. Several working areas have observation windows, produce, fish and meat preparation rooms, dry food storage, dishwashing room, coolers and freezer, and even an insect breeding facility.

DAILY ROUTINE

With this centralised operation, all animal diets are now fully prepared at the commissary, including the weighing and chopping of food per animal group and per feeding moment. Our commissary staff start their day at 7 am, transporting the diets prepared the previous day to several areas around the zoo so they have been delivered by the time the animal keepers begin their day. At the same time, empty food containers are collected and transported back to the commissary to be cleaned and reused.

Back at the commissary, the diets of herbivorous and omnivorous animal species are prepared first. Pellets are weighed and vegetables cut to the right size. A zoo diet application, specifically designed for zoo commissaries, contains relevant and detailed instructions on the feeding regime of each animal group, including types of product, amounts and chopping sizes. Prepared meals then go into labelled containers to be stored in the coolers overnight. In the afternoon, the diets for our meat-, fish- and insect-eaters are prepared in separate working spaces. Meat items and fish are weighed, chopped and supplemented with the help of the diet application. Thanks to



several digital displays, the diets can be seen by the team at several points within the commissary. Once all diet preparation is completed, workstations and preparation areas are thoroughly cleaned and sterilised. During the day, deliveries and orders also take place and the commissary staff might be involved in tours behind the scenes as well.

THE FEEDING STORY

Located next to our main restaurant, an educational path leads visitors to the commissary. As you walk further along the path, children can discover what is on the menu for different animal species and how much food is being provided on a daily basis. Visitors can even 'contact' our Zoo Chefs in the commissary and test their knowledge on the dietary needs of our animals. A close encounter with staff members who prepare meals is a great way to tell the 'feeding story': the animals are fed a diet that meets their natural, nutritional needs and that helps to stimulate their natural behaviour. No, tigers do not eat canned cat food, but will be provided with whole prey animals, which visitors can see being prepared and stored in our cold storage rooms and freezer.

In addition to several educational tools to strengthen our message, zoo guides are present in the public area of the commissary to inform visitors about dietary management in Amersfoort Zoo and, for example, explain the use of our insect breeding facilities. Occasionally, the public area within the commissary will serve as a classroom for primary school students to follow a specially designed course on zoo animal nutrition and welfare.

Visitors can enter the commissary during the opening hours of the zoo. To help them experience all the different factors of the daily routine of

our commissary staff, a three-minute video is played on a large monitor display, in which each facet of our dietary operation is explained.

ANIMAL HEALTH AND WELFARE THROUGH NUTRITION

Appropriate diets are one of the vital elements in the successful management of animals in human care, as nutrition can have beneficial effects on an animal's health, welfare and reproductive performance. The formulation of properly balanced diets for wild animals involves knowledge of the natural feeding strategies and nutritional requirements of the species. Although there have been considerable developments in zoo animal nutrition science and dietary management, providing a nutritionally balanced diet to a broad array of taxonomic groups remains challenging.

In Amersfoort Zoo, a zoo nutritionist is employed to use the formulation and constant evaluation of diets as a tool to contribute to overall animal welfare. The employment of a qualified nutritionist is rare, however. To date, fewer than 20 EAZA accredited zoos in Europe employ a qualified nutritionist and only a few zoos have standardised nutrition programmes in place.

Developing our centralised commissary made us improve our dietary management and operation tremendously. With our transparent and informative storytelling on zoo animal nutrition, we hope to educate our visitors about the importance of animal welfare within our zoological management. We also hope to inspire other zoological institutions in the process of improving their dietary management by designing or redesigning a modern zoo commissary.

Training rewards

HOW CARNIVORE TRAINING PRACTICES HAVE EVOLVED OVER A DECADE AT PARIS ZOO

Quentin Boillot, Yohan Chazelas, Lucie Dolou, Anaïs Michon and Maëla Portier, Zookeepers, Paris Zoo



PHOTOS © M. DESCOMBES, MNHN

Reopened in April 2014, the redesigned Paris Zoo (France) adopted the concept of 'Biozones', in which the large carnivore species are integrated across five ecosystems. In addition to many other benefits, the new facilities have seen an improved infrastructure for carnivore training, based on the zookeepers' experiences and suggestions.

The main goal of the training is to facilitate medical procedures such as external examinations, injections, blood sample collection, X-rays and ultrasounds and topical treatments such as wound disinfection or suturing.

The keepers created a training programme based on positive reinforcement within the framework of protective contact, using both indoor and outdoor facilities. Minor adjustments to existing equipment were made and new tools were developed to ease the demands placed on keepers and to expedite the learning process. For instance:

- Placing nest beds within boxes, effectively creating corridors that encourage animals to crouch and lie against the fence, facilitating touch desensitisation
- Building wooden boxes (e.g. for wolverines) suspended from mesh fencing to encourage immobility during training and expose body areas such as the abdomen
- Adding small trap doors tailored to

the diameter of the tail, enabling the retrieval and stabilisation of the tail during blood sampling procedures

- Modifying fencing to feature slightly larger mesh widths to facilitate finger/tail passages

The positive reinforcement programme adhered to established protocols but incorporated distinctive characteristics, such as the use of hand gestures over traditional target cues; greater emphasis on (micro) shaping behaviour rather than capturing; and administering rewards with a slow-delivery method, such as fish blood dispensed from a syringe, which was instrumental in keeping trained animals still.

The nature of the reward proved critical, both in the variety and in the delivery intervals during training sessions. Liquid rewards helped to keep the animals calm, enabling medical procedures such as blood collection during reward phases; and extending the time interval between rewards facilitated the development of longer or more complex tasks. The latter allows for training sessions in environments where immediate rewards are impractical.

Medical training involving carnivores is carried out as frequently as possible, ideally for short durations on a daily basis, particularly during periods of new learning.

Later, a minimum of two training

sessions per week is enough to reinforce acquired skills. The strategic distribution of training responsibilities among staff is also essential. While a few selected trainers assume primary responsibility, including all keepers as assistants or observers helps to desensitise the staff to potential interactions with the animals and ensures everyone, including the veterinarians, are familiar with the training process.

During the learning phase of a specific exercise, one trainer maintains oversight until mastery is achieved, thus ensuring consistency in both replicability and efficacy. The goal is to have at least one trainer able to perform daily the trained procedures as required.

These new training processes have had a profound and positive impact on both solitary and semi-social carnivore species. The overall goal is to strike a balance between fostering natural, non-human-oriented intra-specific behaviours and minimising stress during required human interactions. Observations indicate that trained animals exhibit low levels of plasmatic cortisol during blood collection procedures. With wise allocation of resources, carnivore husbandry can thus be significantly enhanced to encompass a range of preventative and curative medical procedures, facilitated by a proficient team of keeper-trainers.



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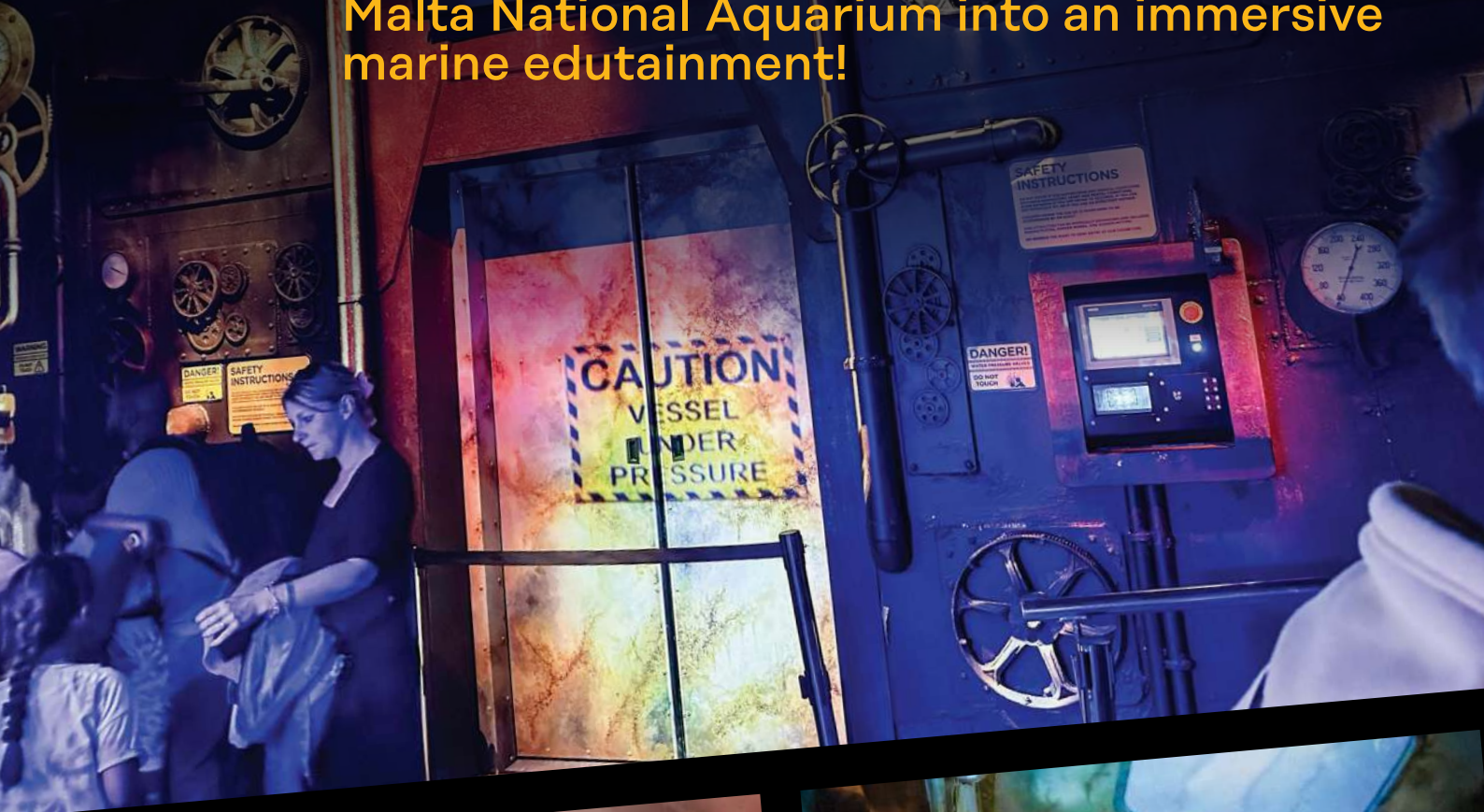
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